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## PATELLO-FEMORAL ARTHRALGIA IN ATHLETES ATTENDING A SPORTS INJURY CLINIC

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### ABSTRACT

Over a five year period, 137 athletes presented to a Sports Injury Clinic with patello-femoral arthralgia. This was 5.4% of the total injuries seen and a quarter of all knee problems treated. Running contributed to 32% of the athletes with patello-femoral pain. There was a 4:1 male:female ratio and nearly 70% were in the 16-25 year age range. A follow-up questionnaire was sent to 72 athletes seen in the last two years with a 78% response rate. Symptoms and treatment are discussed. After conservative therapy only 28.6% were entirely symptom free with a mean follow up of 13.1 months.

**Key Words:** Rheumatology, Patello-femoral, Chondromalacia patellae, Sports injury.

### INTRODUCTION

Patello-femoral pain is a common complaint of athletes attending Sports Injury Clinics (Brody, 1980; Williams, 1980; Dehaven et al, 1979). The differential diagnosis always includes chondromalacia patellae but other causes must be considered such as osteoarthritis, osteochondral fracture, osteochondritis, malalignment syndromes, overuse syndromes, sympathetic dystrophy and peri patellar pathology (Insall, 1982).

Chondromalacia patellae has often been used wrongly as a synonym for patello-femoral pain. Several arthroscopic studies have shown that in patients with patello-femoral pain which is clinically consistent with chondromalacia patellae 19% (Lund and Nilsson, 1980) to 49% (Leslie and Bentley, 1978) do not have any pathological findings.

Arthroscopic evidence of chondromalacia patellae does not prove that this is the cause of patello-femoral pain. Abernethy et al (1978) found that cartilage fibrillation at the central medial facet was present in 85% of unselected necropsy specimens. Ficat and Hungerford (1977) have noted that other sites in the patello-femoral apparatus may cause symptoms. It has also been suggested by Williams (1980) and Dehaven et al (1979) that in athletes the pain is due to an extensor mechanism dysfunction which may or may not be associated with

chondromalacia patellae.

There have been numerous surgical procedures developed either to treat the patella locally or to correct the malalignment problems. All have variable results and many authors (Outerbridge and Dunlop, 1975; Kettelkamp, 1981; Bentley, 1978; Gruber, 1979) recommend an initial trial of conservative therapy. This includes a combination of symptom explanation; modification of activity including avoidance of squatting, kneeling, walking or running down steep hills, using stairs or other activities where flexed loaded knee positions occur; anti-inflammatory medications; patellar support bracing; isometric quadriceps exercises and faradic stimulation of the vastus medialis muscle (Williams and Street, 1976).

Patello-femoral pain can become a chronic problem resulting in disability (Karlson, 1940; Robinson and Darracott, 1970; Hvid et al, 1981). Dehaven et al (1979) in a study of athletes with a clinical diagnosis of chondromalacia patellae found that 18% failed to improve on a conservative treatment programme.

This retrospective study of patello-femoral arthralgia in athletes was undertaken to review the natural history of this problem as well as the response to conservative therapy.

## PATIENTS AND METHODS

This is a study of athletes attending the Sports Injury Clinic of Addenbrooke's Hospital, Cambridge over the five years January 1978 to December 1982. Each patient attending the clinic had a card on which the name, date of birth, address, date of initial consultation, sport causing injury and follow-up were recorded. Athletes later presenting with a different injury were included in the figures for analysis as a separate event. From these records the incidence of knee injuries could be determined.

The diagnosis of patello-femoral arthralgia was made by the same rheumatologist in all patients. For the diagnosis to be made, there had to be a history of retro-patellar pain related to exercise. On clinical examination tenderness was also required with pressure over the patella and pain on quadriceps contraction combined with retropatellar crepitations. Initially, all patients were referred to the physiotherapy department for a course of conservative therapy.

A follow up questionnaire was sent to all patients having had a diagnosis of patello-femoral arthralgia placed upon their card during the two years of 1981-1982. Since 60% of the patients were University students it was felt that athletes seen earlier than this would be difficult to contact. Questions were included on duration of pain, preceding trauma, symptoms, therapy, response, surgery and recurrence. A final question 'are you happy with the service provided by the Sports Injury Clinic?' was included to determine the satisfaction of patients replying.

## RESULTS

During the five year period 2519 separate injuries were reviewed. Of these, 549 (22%) were knee injuries. There were 137 athletes with patello-femoral arthralgia. This amounted to 25% of the total knee problems.

Fig. 1 lists the sports associated with patello-femoral arthralgia. Of these 32% were related to running while this group comprises only 20% of the total clinic. The short distance group included most track events while the long distance group included marathon, cross country and orienteering. Football and Rugby were associated with a 20% incidence of patello-femoral arthralgia while this group represented 36% of the total injuries seen at the clinic.

There was no difference in the age (Fig. 2) and sex distribution of athletes with patello-femoral arthralgia when compared with the whole clinic. Nearly 70% were in the 16-25 year old group. There were 109 males (80%) and 28 females (20%) seen over five years.

There were 72 athletes seen in the last two years and

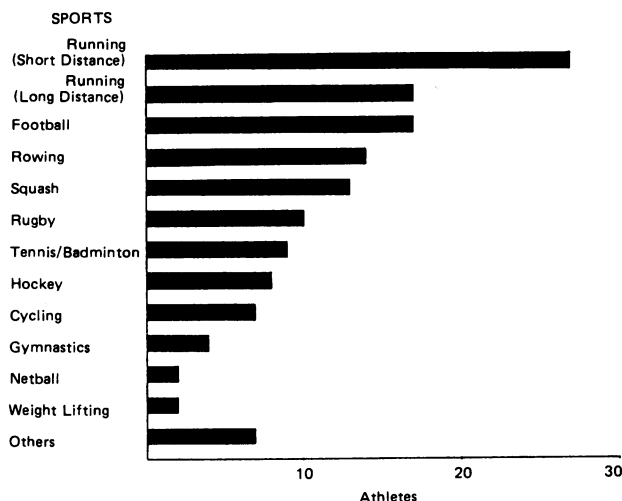


Fig. 1: Sports related to patello-femoral arthralgia.

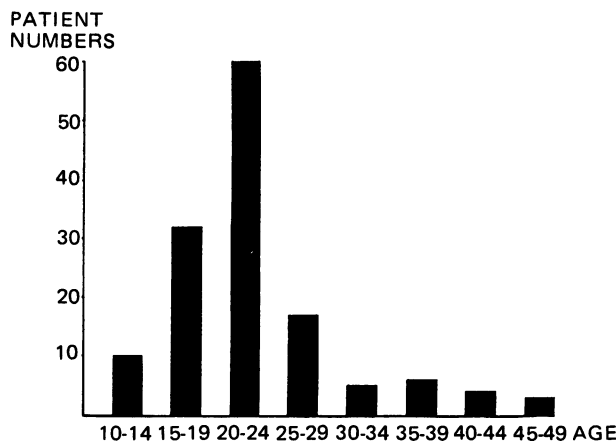


Fig. 2: Age distribution of patients with patello-femoral arthralgia.

56 (78%) of these responded to the questionnaire. Of the responders the follow up period from their first visit was  $13.1 \pm 7.7$  months.

For these 56 athletes the mean age at presentation was  $24.4 \pm 9.8$  years which remains similar to the initial group. The pain associated with the presenting episode had been endured for a mean of 15.3 weeks (range 1-120) before attending the Sports Injury Clinic. Twenty-two patients had suffered from episodes of patello-femoral pain ranging from 1-23 years prior to presentation with a mean duration of 4.4 years.

Table 1 lists the symptoms noted by the 56 athletes responding to the questionnaire. 17 athletes remembered a preceding injury to the patella of which this was a fracture in 2 cases. Only 2 patients had ever suffered from a

TABLE I

**Symptoms in patello-femoral arthralgia (56 athletes)**

Worse with activity	84%
Worse after activity	71%
Clicking knee	64%
Aggravated by climbing upstairs	50%
Aggravated by going downstairs	48%
Worse after prolonged sitting	39%
Knee giving way	39%
Knee locking	23%

patellar dislocation. 11 patients had symptoms in both knees while 26 had pain in the right knee and 19 had pain in the left knee.

The conservative treatments used are listed in Table II. All patients were seen by the same physiotherapist and given quadriceps strengthening exercises with particular emphasis to the vastus medialis. Physiotherapy was found helpful by 43 patients but only 39 had an initial recovery. Of the 17 (30%) with persisting symptoms 13 were unable to recommence sporting activities despite the addition of faradic stimulation to the vastus medialis in 4 and non-steroidal anti-inflammatory drugs in six. Only 7 patients claimed to be unhappy with the service provided by the Sports Injury Clinic, and these were in the group of 13 unable to recommence sporting activities because of persisting pain.

TABLE II

**Conservative therapy used in athletes with patello-femoral arthralgia (56 athletes)**

Quadriceps strengthening exercises	100%
Ice/Heat	64%
Ultrasound	45%
Non-steroidal anti-inflammatory drugs	41%
Faradic stimulation of vastus medialis	23%

One patient in the unresponsive group had previously had a fractured patella and a lateral release for confirmed chondromalacia patellae. 4 others had chondromalacia confirmed at arthroscopy and surgery for their recurrent episodes of patello-femoral pain.

From Table III it can be seen that of the 39 athletes with an initial resolution of patello-femoral pain, there were 23 with recurrent symptoms. 12 described the pain as moderate and 11 as mild. All would resolve over a few weeks with rest and often only after recommencing their quadriceps exercise programme. The initial resolution of pain took a mean of 6.8 weeks (range 1-25 weeks) from the start of conservative treatment to recommencing sport.

TABLE III

**Response of patello-femoral arthralgia to conservative treatment (56 athletes)**

Full recovery with no recurrence	16
Recovery but episodic recurrence	23
Pain persisting but able to play sport	4
Pain persisting and unable to play sport	13

**DISCUSSION**

Patello-femoral arthralgia occurred in 5.4% of athletes seen in the Sports Injury Clinic over a five year period. Williams (1980) reported an incidence of up to 10% of chondromalacia patellae in athletic injuries.

Knee locking was noted in 23% of patients while 39% complained of the knee giving way. Hughston (1968) claims that these are often symptoms of patella subluxation which he feels is a much more common problem in athletes than previously accepted. Dehaven et al (1979) classified 55% of their patients into patella subluxing or dislocating groups. In this study partial subluxation may have contributed but only 2 patients had patellar dislocation prior to the onset of their pain. None of the others on clinical examination had evidence of discomfort or apprehension on attempts to sublux the patella passively.

Trauma does not appear to be a major contributing factor in the production of patello-femoral arthralgia. Actual patella trauma occurred in only 29% of athletes and 2 of these had suffered a patella fracture. These were associated with contact sports (e.g. Football; Rugby) while the non-contact sports (e.g. Running; Rowing) contributed the higher number of patients with patello-femoral pain.

It would appear that there are other contributing factors than direct trauma or subluxation. Hvid et al (1981) suggest abnormal patello-femoral joint mechanics while Dehaven et al (1979) suggests an extensor mechanism dysfunction. Certainly there has been some success with treating the quadriceps muscle by faradism (Williams and Street, 1976) or exercise (Dehaven et al, 1979) and vastus medialis muscle wasting appears to play a part in the onset of symptoms (Williams, 1980).

Only 16 athletes (28.6%) from 56 claimed to be entirely symptom free at a mean follow up of 13.1 months. This compares with the figures from Karlson (1940) in a 1-20 year follow up 14% (10/71) were symptom free, Robinson and Darracott (1970) in a 2-6 year follow up 29% (17/58) were symptom free and Hvid et al (1981) in a 5.7 year average follow up where 27% (6/22) were symptom free. Despite these reports many authors believe that patello-femoral pain is usually a self-limiting condition (BMJ Editorial, 1981).

Even with a classic presentation there is a wide differential diagnosis for the syndrome of patello-femoral arthralgia. Further studies need to be undertaken to determine the relationship between patello-femoral arthralgia, extensor mechanism dysfunction and chondromalacia patellae.

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